CHAPTER 6:
Working at U.S. Antarctic Program Facilities

U.S. Antarctic Program participants carry a refueling hose to a U.S. Coast Guard icebreaker.

The United States operates three year-round stations in Antarctica, two research vessels, and numerous summer seasonal field camps. This chapter discusses safety, health, and training considerations and then gives an overview of each facility, describing the key administrators, guidelines on waste management, and provides information about communications and mail service.

SAFETY, HEALTH AND RECREATION

Safety and health concerns are discussed at numerous places in this manual. The nature of Antarctica, and its great difference in many ways from most places, require that this subject receive fuller treatment here.

In the last decade, antarctic safety and health issues have been addressed with increasing effectiveness. U.S. Antarctic Program goals are to protect your safety and health and to ensure that facilities, equipment, and materials are not damaged or lost by mishaps.

Fire Safety

Fire is the **most serious threat** that confronts participants in Antarctica. Shelter is critical to our survival and because of the dry and windy conditions, fires start easily and spread rapidly in Antarctica.

Most fires are directly attributed to carelessness, poor housekeeping, or faulty electrical or mechanical operations. If precautions are taken to eliminate dangers in these areas, the threat of a disastrous fire can be greatly reduced.

All participants need to understand and obey fire prevention rules, become familiar with their surroundings, respond rapidly to any alarms, know and follow evacuation and muster plans, know how to locate and operate extinguishers, and understand how and where to report a fire.

Required Training

Since much of your work in Antarctica will **not** be unique to that region, you are expected to use work practices that are consistent with U.S. occupational safety and health standards. For situations that present unusual or unique hazards because of Antarctica's extreme environment, you will be provided specific instruction (for example, how to act on sea ice or around airplanes).

The ***Field Manual for the U.S. Antarctic Program*** provides information on field party preparation, safety training, transport safety, radio usage, weather, shelters, sea ice, glacier travel, rescue, etc. At least one copy is provided to each field science team. Copies are available at RPSC work centers and on the web at www.usap.gov.

SAFETY

The five most common injuries are...

- Sprains/Strains
- Contusions (bruises)
- Lacerations (cuts)
- Fractures
- To the eye

If you do have an injury…

- Report it immediately.
- Get immediate medical attention.
- Never hesitate or delay going to Medical for treatment.
- You could be penalized for not reporting an injury or a near miss incident.
- We believe reporting and analyzing incidents, and acting on results, is the best way we can help can prevent future incidents.
- Accidents or injuries caused by failure to follow safe work practices, procedures, or training could result in disciplinary action.

If you have people working for you…

- You are responsible for fostering a safe work place.
- You must ensure your employees are properly trained, work safely, maintain safe conditions, and are aware.
- In the event of an injury or incident, you must complete an injury or incident investigation report, and take corrective action.
- The report must be filed the day of the injury.

Field Safety Training (Survival School)

The U.S. Antarctic Program continually strives to improve safety. Part of this effort consists of field safety training which has several objectives:

1. To provide basic training in cold weather survival skills. Topics covered include cold weather camping, use of antarctic clothing, hypothermia and frostbite, snowcraft, mountaineering, working on sea ice, and other areas.
2. To enable field teams to use the actual equipment they will be using in the field. An opportunity for the project teams to set up and demonstrate the proper use of tents, stoves, radios, snowmobiles, and sleds pays obvious dividends.
3. To provide an opportunity for field team members to work together as a unit, perhaps for the first time, before going into the field. This is an excellent opportunity for the field team leader, as well as the individuals on the team, to learn the strengths and weaknesses of the team members.

Generally, anyone who may require overnight stays away from a station must complete training appropriate to his or her expected exposure, previous training, and experience. Some courses are tailored to the needs of each group. For example: instructions for parties spending their time in the Dry Valleys, groups working on sea ice, and groups traveling long distances by snowmobile.

The courses are not intended to develop essential field skills (mountaineering, or traversing crevasse fields, for example) in the inexperienced person. Rather, they familiarize proficient people with specific situations they might encounter in the Antarctic. Leaders of remote field projects should select team members with wilderness survival skills and at least one safety guide to oversee activities.

Due to the nature of the instruction, there is some risk of injury. The instructors have full responsibility for conducting the program safely. Please follow their directions. People who enter the training area to observe are also the responsibility of the course instructors; failure to respond to directions given by course instructors will result in being asked to leave.

Health Considerations

Antarctica's extreme environment and relative isolation challenge human health and wellness. Health is a 24-hour-a-day consideration; it involves occupational and non-occupational issues, both physical and mental. Emergencies risk not only the victim, but also others such as medical personnel and flight crews who provide treatment and evacuation. This expenditure of money, manpower, and equipment resources diminishes the ability to perform the program's principal

mission of scientific research.

To help minimize risk, the program requires the advance medical screening described in Chapter 2. Certain medical conditions can present unexpected risks under antarctic conditions, where each participant must be capable of physical activity wearing bulky cold weather gear while being exposed to low temperatures and high altitudes, possibly under survival conditions.

Common Colds. Although the 'Crud' waylays many antarctic travelers, it is not true that exposure to cold temperature causes upper respiratory infections or 'colds.' They are caused by a host of viruses and are spread by droplets. Covering your mouth when you cough/sneeze, not sharing cups and eating utensils, and washing your hands after coughing or sneezing will reduce exposure.

Colds usually last from seven to ten days with or without treatment. The best care is rest, adequate nutrition, and increased fluid intake.

Antarctica is a polar desert and very dry. In such a dry environment large amounts of fluid are lost via your skin and lungs and the mucous membranes lining your nose and mouth become dry and no longer protect you against viruses. Increase your fluid intake according to your location and your level of physical activity. Caffeine and alcohol will increase fluid loss, so avoid consuming large amounts of beverages/foods containing alcohol and caffeine, particularly if you are dehydrated. Chocolate and many soft drinks contain caffeine.

Additional Guidelines

Aspects of environmental protection are covered in many parts of this guidebook. It is your responsibility to know them. Here are a few more common-sense examples of how you can do your part.

Don't Litter.

Secure construction sites.

Handle waste properly.

Leave only footprints.

Handle lab chemicals properly (including photographic chemicals).

Don't spill fuel.

Help clean up.

Remove all waste from camps.

Avoid disturbing wildlife.

Do not introduce plants or animals into the Antarctic or collect rocks or fossils.

Do not enter any of the Antarctic Specially Protected Areas

Avoid interference with scientific work

Take care of antarctic historic monuments.

Always keep together with your party.

Sunburn. Snow or ice reflects 85% of ultraviolet radiation. Overestimate the protection necessary and carry a sunscreen with an SPF number of 15 or greater that includes both UVA and UVB protection. Reapply frequently according to package directions.

Altitude Sickness. Some of the field camps and Amundsen-Scott South Pole Station are at physiological elevations above 10,000 feet (3,000 meters). The flight from McMurdo doesn't allow time to acclimate enroute. If you are assigned to these areas, you should check with your doctor to see if living at the high altitudes will affect any preexisting medical problem. A medicine called Diamox will be available at McMurdo Clinic. Treatment should begin 24 hours before leaving for the high altitude. This medicine is contraindicated for those allergic to sulfa medications. The signs of altitude sickness are shortness of breath that is not relieved promptly by resting, headache, dizziness, and difficulty sleeping. They can be minimized by avoiding strenuous activities the first two days, increasing fluid intake, stopping or limiting smoking, and avoiding alcohol and caffeine. Altitude sickness can occur as late as five days after reaching altitude, and occasionally, can progress to a serious medical condition requiring evacuation to a lower altitude. Anyone developing symptoms should see the local medical provider.

Snowblindness. Caused by exposure of the eyes to excessive light, at levels typical in Antarctica, this condition can be serious, painful, and disabling. You prevent snowblindness by wearing 100% UV protective sunglasses. Snow goggles are issued to those who need them. Everyone in Antarctica must have sunglasses that protect the eyes from ultraviolet radiation. Some 'dark' glasses do not block UV. They do more harm than good because the iris widens to admit more light. Sunglasses

are especially important on windy days to protect against volcanic ash particles in the eyes. For more information refer to Chapter 3: What and How to Pack.

Female Considerations. Many women living in Antarctica experience a variety of changes in their menstrual cycles. It is thought that this occurrence may be due to the changing daylight cycles and to the close proximity of other women.

Smoking. In addition to the well known health hazards, smoking greatly increases your chance of dehydration. Smoking is prohibited in all indoor areas except those designated specifically as smoking areas. Smoking outside is allowed except in fueling and hazardous areas. Put cigarette butts in appropriate containers—not on the ground.

Recreation and Personal Conduct

A range of authorized recreational opportunities are available in Antarctica. McMurdo Station has facilities for physical exercise and recreation including volleyball, basketball, football, darts and the annual Scott's Hut Race. Jogging, aerobics, and weight training are popular. South Pole and Palmer stations also have recreational facilities, although more limited than McMurdo. Activities at these two smaller stations are more spontaneously organized. Off-station activities such as hiking may be pursued in accordance with safety rules issued at the stations. Residents are encouraged to use the recreational facilities and activities.

Because of the nature of Antarctica, certain restrictions are required to ensure safety. Many operational procedures may impinge on what may appear to be excellent forms of recreation. For example, restrictions forbid a Sunday stroll through the pressure ridges near Scott Base to see the seals, walks on un-flagged snow or ice fields, local mountain climbing or a tour of old South Pole Station. Accidents have happened, and we wish to prevent recurrences. Different people perceive risk and hazards in different ways; heed the wisdom of those who have gone before you, and follow the safety procedures that have evolved. Antarctica is as cold, and as indifferent to one's presence, as it was when Robert F. Scott was there.

The work equipment you are issued is for authorized activities. Due to the nature of the field equipment you have access to, you may be tempted to engage in unauthorized overnight camping trips, skidoo races, or Sunday drives to the ice runway. You are authorized to use the U.S. Government equipment issued to you only to accomplish your approved program.

The guidelines and operational procedures that govern your conduct while in Antarctica vary considerably at different locations and with changing conditions, particularly weather. Familiarize yourself with local knowledge at your station or camp, and follow local regulations. These are only guidelines; it is impossible to write rules to cover all circumstances. Regulate your own activities to avoid injury to yourself and hazards to others who might have to attempt rescue. Antarctica—every part of it—can suddenly and unexpectedly become a very dangerous place.

Attendance of an ***Outdoor Safety Training Session*** is required by McMurdo residents before they are allowed to recreate off-station. This half-hour discussion covers rules and guidelines for safe travel, explains the check-out process and participants receive cards to verify training.

Alcohol & Drugs

Even during off-duty hours, events may require swift, intelligent action. The ability of a person to deal effectively with a mishap is reduced if he or she is intoxicated. The National Science Foundation will not tolerate abuse of alcohol or unauthorized use of controlled substances. Drug and alcohol abuse will result in your removal from Antarctica and may become a barrier to future participation in the program. Existing grants are subject to revocation in the event of substance abuse.

Persons under the influence of alcohol or other controlled substances will not be allowed on program airplanes.

U.S. Criminal Jurisdiction

Public Law 98-473, the Comprehensive Crime Control Act of 1984 (Part H, chapter XII; 18 USC 7), extends Special Maritime and Territorial Jurisdiction to cover offenses committed by or

against U.S. nationals in areas not under the jurisdiction of other states. Since, in accordance with provisions of the Antarctic Treaty, the U.S. does not recognize territorial claims in Antarctica, this law establishes that persons **can be prosecuted** in a Federal court for violation of U.S. criminal law in Antarctica.

WASTE MANAGEMENT AND RECYCLING

Every participant deployed in the U.S. Antarctic Program is expected to comply with applicable environmental and safety guidelines. This includes participation in the waste management and recycling program.

McMurdo Station separates all wastes, including cardboard, scrap metal, aluminum, glass, white paper and plastic for return to the U.S. Upon arrival, everyone is required to attend a briefing regarding the waste segregation and recycling program. Appropriately labeled receptacles and dumpsters are located throughout McMurdo to assist personnel in proper segregation.

Additionally, the management of daily non-recyclable wastes is somewhat more stringent in Antarctica than any other place. Personnel in the U.S. Antarctic Program are required to sort their own "garbage." Marked receptacles are located in work centers and housing areas for the separation of not only recyclable, but of burnable, non-burnable, and potentially hazardous wastes (i.e., dry-cell batteries, aerosol cans) as well. A recycling system is also in place at all other antarctic locations.

The antarctic environment requires us to pay close attention to aspects of life easily overlooked at home. Services we typically take for granted—abundant electrical power, plentiful potable water, ample food, convenient transportation, and timely and easy waste disposal—are scarce and expensive in Antarctica. Their conservation and efficient management are imperative if the United States is to continue to support broad-based science programs in Antarctica. For that reason, and because of our commitment to preserving Antarctica for future research and discovery, the United States Antarctic Program requires that participants carefully think about what they bring, use, or throw away in Antarctica. Regulations governing waste management under the Antarctic Conservation Act specifically require that we change the way we think about trash.

Given that neither climate nor the remoteness of the southern polar region are naturally conducive to human life and work, everything needed to support scientific research in Antarctica must be shipped or flown in. The USAP waste management practices follow the same principle in reverse: All the program's refuse—except waste water—is returned (retrograded, in antarctic parlance) to the United States for recycling, reuse, or proper disposal. Despite the challenges to waste management posed by the Antarctic environment, the task may be stated simply as: What comes in must eventually go out.

The intent is to diminish the environmental impact of a sizeable human presence on a continent where cold, dry conditions tend to preserve things rather than degrade them. In addition, we must be efficient and cost effective in the allocation of resources necessary to handle waste generated in Antarctica in order to further the USAP's primary antarctic mission: support of research. Like most waste reduction efforts in communities at home, the USAP operates according to the tenets of reduce, reuse, and recycle.

COMMUNICATIONS

Communications within Antarctica, and between Antarctica and other parts of the world, are a vital and integral part of research and support in Antarctica. The primary use of communications is to support official requirements of the U.S. Antarctic Program, including both science and operations. However, there are opportunities for personal use of communications on a "not to interfere" basis.

In the last several years, satellite links, microwave ground links, repeater stations, electronic mail, and other innovations have dramatically improved antarctic communications. This transition, and adaptation of emerging technologies, will continue to evolve in the U.S. Antarctic Program. The

information provided below is thus subject to change, and you should look for updates.

A small **computer** center is available 24 hours a day at all 3 stations for public use. The standard operating system is Windows XP. Personnel are not allowed to download or install software without prior approval. Some of the computers are set up for digital camera downloading and photo manipulation. Memory card readers are available on a few computers. Some public use computers have CD burners, but it is the responsibility of the participant to provide their own CDs.

Internet and e-mail are available at all three stations. The South Pole currently only has connectivity 12 hours a day. Non-grantees will be assigned a USAP e-mail address upon arrival at their destination station. You will be able to access your personal e-mail account (e.g., Hotmail, Yahoo) while in Antarctica. E-mail attachments cannot exceed 5 MB. Business and science attachments in excess of 5MB can be FTP'd with the assistance of the Information Technology (IT) personnel. Grantees can FTP files at any time, with or without IT assistance.

Grantees will **not** be assigned a USAP e-mail address unless one is either requested in your SIP or once you have arrived on station. If a local account is not requested, all local mail will be forwarded to the e-mail address specified in your SIP. Both Macs and PCs are available, as is a scanner, a color printer and an E-size plotter. Grantees are reminded to bring any special cable connections for digital cameras in addition to driver software. Grantees will be allocated blank CDs and DVDs as specified in their Research Support Plan.

Laptop computers. All agency, grantee and personally-owned computers must first pass a basic security check administered by Information Technology staff prior to accessing network resources. It is required that all visiting computers have up-to-date anti-virus software that is configured to receive current anti-virus definition (DAT) files on a regular basis, and must undergo a full virus scan. This process is necessary to protect the network from computer viruses and other potentially harmful elements.

Such computers are judged on a Pass/Fail standard. In the case of Fail, Information Technology will provide limited support to resolve the matter (determined by the PC Technician Lead, based on criteria including work load, problem scope, cost, and availability of technical resources). For grantees, every effort will be made to bring the laptop up to current virus-protection standards.

In formulating your plans for research or working in Antarctica, please be aware of the following list of Information Technology-related directives.

- All personal laptop Operating Systems must have the most current software patches installed from the vendor. This is to reduce vulnerabilities from virus or security attacks.
- When connected to the USAP network, do not activate personal firewalls until the firewall is registered with the PC Technicians.
- Large e-mail attachments are restricted according to the station's or ship's limitations in bandwidth. Contact your POC for more information.
- You will be using a federal government computer system and should be aware that you should have no expectation of privacy when using NSF-provided computers, access to the Internet or electronic mail systems. Files maintained in NSF computers, including electronic mail files, may be reviewed by NSF officials who have a legitimate reason to do so when authorized by the Director or Deputy Director or by the Inspector General.
- Failure to comply with these directives could result in disciplinary action.
- For additional IT related issues, contact your point-of-contact.

PROHIBITED AT ALL THREE STATIONS AND FIELD CAMPS

- Wireless communications systems or equipment
- Wireless network equipment, without prior approval
- Wireless Internet devices (802.11x)
- Cordless telephones
- Cordless headsets
- Personal network equipment (hubs, routers, switches, etc.), without prior approval
- VHF radio or family-services radios
- Broadcast equipment
- Radio Control devices

Telephones. U.S. Antarctic stations and ships access commercial and government satellites for transmission of data and voice. This service is available for business and private use, although official communications have priority. The satellite systems are very reliable, but service outages do occur. A calling card (e.g., MCI, Sprint) is needed to place personal calls from all three stations in

Antarctica. South Pole residents can place personal phone calls during satellite connectivity, currently at 12 hours per day.

Field-party communications. Each station and ship uses hand-held and/or vehicle-mounted VHF radios for local communications. The observance of radio etiquette is necessary to ensure efficient and available radio communications. Keep messages short and professional. For more information on proper radio etiquette, contact the communications group for your station.

Before leaving for a lengthy field deployment or even for a day, you must inform the communications center of your intentions. Frequencies and call signs are assigned, and daily check-in procedures are arranged. To avoid unnecessary search and rescue missions, every effort must be made to adhere to the established daily check-in. Immediately on returning from the field, inform the communications center that the party has returned safely.

Postal Services. U.S. domestic postal rates and regulations apply to all Air Post Office (APO) mail to New Zealand, McMurdo and South Pole Stations. There is no APO service to Palmer Station and the research vessels. More specific postal information is **detailed later in this chapter**. While postage stamps can be purchased at all 3 stations, participants should bring a supply of stamps with them.

POSTAL SERVICE IN ANTARCTICA DEPENDS ON YOUR:

- Location
- Time of year
- Weather
- Available transportation

Read this section!

All NSF and RPSC sponsored U.S. Antarctic Program participants are granted use of the U.S. Air Post Office (APO) in Christchurch for 10 days on arrival in New Zealand from the U.S. and again for 10 days on return to Christchurch from McMurdo Station. The Christchurch APO accepts N.Z. cash (not U.S.), travelers checks and personal checks.

You cannot order items via the Internet from Antarctica for courier delivery (i.e., FedEx) to the APO. The APO will not accept such deliveries. Alternatively, you can send mail and parcels through the New Zealand postal system at the international postage rate.

Mail is received in Christchurch, New Zealand, seven days a week. Letter mail is transported to from Christchurch to Antarctica on all available southbound flights. Letter mail service varies, generally taking 5 to 14 days, but sometimes longer depending on the time of year. Letter mail always takes priority over package mail both to and from Antarctica. Packages have the lowest priority of all cargo being transported to Antarctica resulting in a delivery time of up to 6 weeks. Please do not send perishable foods.

Packages destined for summer participants at McMurdo or South Pole should be mailed after Labor Day or they will be returned. Mail that misses summer participants is either forwarded (if a directory card has been given to the McMurdo post office), or returned to the sender.

There is no mail service to McMurdo or South Pole Stations during the winter. If you are wintering at these stations, advise friends and relatives that most parcels mailed after February 1 will not be received in Christchurch in time to be forwarded to you. Mail not received in time for forwarding to Antarctica before the winter isolation begins will be held for you until the next summer season.

The most cost-effective way to mail a parcel weighing more than 10 lbs. to Antarctica is parcel post. If you have a parcel that contains only videos, books or CDs it can be sent special fourth class “book rate,” which is the lowest cost. Do not use "packing peanuts" and instead use clothing or something similarly useful and non-polluting to cushion the objects being mailed.

Do not rely on mail service for critical business. While mail services are provided and are fairly reliable, the timing for delivery is always subject to weather, transportation options, cargo space, forwarding and your movement between locations.

Marketing of clothing or other finished articles, printed or manufactured outside of Antarctica, requiring shipment or transportation to Antarctica is prohibited. **Usage of an APO address to mail articles for resale is not permitted.** This prohibition is based on federal law outlining the usage of the APO address.

The Postal Service prosecutes people who mail items improperly. The Postal Service states, “full

responsibility rests with the mailer for any violation of law under Title 18, United States Code 1716, which may result from placing these items in the mail."

Remember, all mail going to McMurdo, South Pole and surrounding field camps is subject to customs, agricultural and drug inspections as it passes through Christchurch.

The **Do Not Mail** box on this page lists prohibited items. For a complete listing of prohibited/restricted items, ask your local post office to show you a copy of *Publication 52, Acceptance of Hazardous, Restricted, or Perishable Matter*, or go to: www.usps.com and conduct a search for *Publication 52*.

Hold in New Zealand. If you wish to have mail held for you in Christchurch, you must be either currently on station in Antarctica, within 90 days of arrival on station, or plan to redeploy within 10 days of the mail arrival. Your name will be checked against the computer database to verify your deployment dates. Please advise your correspondents to use this address:

[Your Name]
c/o RPSC HOLD IN CHC
PSC 467 Box 296
APO AP 96531-1034

DO NOT MAIL

- Chemicals, explosives, flammable materials
- Biological materials
- Intoxicating liquor
- Odor-producing materials
- Sharp instruments
- Drugs
- Articles for resale

All mail passing through Christchurch will be subject to MAF/Customs inspection. This includes duty on goods on mail being held in Christchurch.

Mail to/from New Zealand. If you are corresponding with New Zealand residents, have them use this address to avoid the unnecessary time and expense of having the letter go to the United States:

[Your Name]
McMurdo Station
Air Post Office
Private Bag 4747
Christchurch, New Zealand

This address is a courtesy and must not be used for ordering large quantities of personal goods. All mail must comply with USPS regulation (i.e., no alcohol). The Christchurch postmaster reserves the right to refuse goods deemed excessive.

NOTE: Goods must go through the New Zealand post system. Items delivered by any other agency (i.e., FedEx, UPS) will be refused. If you are in any doubt, seek advice from the postmaster in McMurdo or Christchurch before posting mail.

Philatelic mail. Philatelists (stamp collectors) are interested in receiving mail from Antarctica, and the National Science Foundation has a procedure (below) to support philately at a level not to interfere with the science mission.

While in Antarctica, you may receive unsolicited philatelic mail from collectors. The Foundation discourages this unauthorized philatelic activity, and you will be entirely within your rights in declining to respond to such unsolicited requests. Please discard the material in the appropriate recycling container.

If you receive large amounts of unsolicited philatelic mail, bring it to the attention of the station manager or the NSF Representative.

Philatelists may obtain a maximum of two covers (self-addressed stamped envelopes) a year by writing to the postal clerks (addresses below) at the three year-round U.S. Antarctic stations.

1. No more than two covers per person per station per year.
2. Covers will be processed for personal (that is, non-commercial) use of individuals only.
3. U.S. correspondents use domestic first-class postage for the APO addresses (below) and international first-class or air mail postage for the Palmer Station address.
4. Non-U.S. correspondents use international first-class or airmail postage.

Philatelic Mail Clerk
McMurdo Station, Antarctica
PSC 469
APO AP 96599-1035
Philatelic Mail Clerk

Palmer Station, Antarctica
c/o AGUNSA
Deposito Franco Antartico
P.O.Box 60-D
Punta Arenas, Chile

Amundsen-Scott South Pole Station, Antarctica
PSC 468 Box 400
APO AP 96598
Philatelic Mail Clerk

Covers are not processed if these guidelines are not followed. Philatelic mail is processed and returned to senders as soon as possible, but the processing is in addition to regular duties of station personnel. Some processing is done during the austral winter, when antarctic stations are isolated, resulting in year-long (or longer) delays in mailing covers back to the collectors.

STATIONS AND SHIPS

McMurdo Station

McMurdo (77°51'S, 166°40'E) is the main U.S. station in Antarctica. It is a coastal station on the barren low ash and lava volcanic hills at the southern tip of Ross Island, about 3,864 km (2,415 miles) south of Christchurch, New Zealand, and 1360 km (850 miles) north of the South Pole. The original station was constructed in 1955-1956. With many additions and modernizations over the years, today's station is the primary logistics facility for airborne resupply of inland stations and for field science projects. The station is also the waste management center for much of the U.S. Antarctic Program. Year-round and summer science projects take place at McMurdo. A 4,320 square meter laboratory, the Albert P. Crary Science and Engineering Center, was completed in 1994. Other facilities are maintained for various studies.

An aerial view of McMurdo Station, the largest research facility operated by the U.S. Antarctic Program.

The mean annual temperature is –18°C (0°F). Temperatures may reach 8°C (46°F) in summer and –50°C (–58°F) in winter. The average wind is 12 knots, but winds have exceeded 100 knots.

Approximately 90% of U.S. Antarctic Program participants reside or pass through McMurdo Station. The austral winter population ranges from 150 to 200, and the summer population may exceed 1,100. The station is normally isolated from late February until early October, except for a brief period in August when several closely spaced flights (known as WINFLY, for winter flights) deliver personnel, supplies, and early science parties.

McMurdo has three airfields that are used at different times and for different reasons. Williams Field is a skiway 16 kilometers from McMurdo on the Ross Ice Shelf and is the aerodrome for ski-equipped airplanes. The annual sea ice runway is used for wheeled airplanes and is a harder, smoother runway on sea ice, but it can be used only from late September through early December, before the sea ice softens and becomes un-usable. A permanent glacier blue-ice runway, the Pegasus site on the Ross Ice Shelf, can be used by wheeled planes but is farther from McMurdo than the other two airfields. McMurdo also has a heliport on the edge of town.

McMurdo Sound is an historic area. On his voyage of 1839-1840, James Clark Ross brought his ships *Erebus* and *Terror* into the sound before sailing eastward along the front of the great ice shelf that now bears his name. In 1901, Robert F. Scott wintered the *Discovery* in Winter Quarters Bay, adjacent to the station. A hut he built in 1901 still stands. Scott in 1901-1903 and 1910-1913 and Ernest Shackleton in 1907-1909 and 1914-1916 deployed their sledging parties from

the area. Other huts used by these expeditions, at Cape Royds and Cape Evans, still stand and are open on a limited basis for tours.

An active volcano, the 3,794-meter Mt. Erebus, is a landmark. On the west side of McMurdo Sound, the Royal Society Range and an extinct volcano, Mt. Discovery, are spectacular vistas.

The booklet ***Recreational Walking Guide to Ross Island*** gives information on the history of the McMurdo Sound area.

Housing at McMurdo Station is similar to college dormitories with a community bathroom down the hall in most dorms. Linens, blankets and pillows are provided, but a towel, slippers or shower shoes, and toiletry container are recommended. Participants are assigned at least one roommate. Those transiting through McMurdo to the South Pole or field camps will be assigned to transient housing in the bunkroom or 4 to a room. Due to round-the-clock operations, roommates may arrive at any time of the day or night.

EMERGENCY?

In an emergency, your family can get a message to you in Antarctica by calling RPSC headquarters in Denver (303.790.8606). Ask for Human Resources and explain that this is an emergency.

Diesel-driven generators provide **electrical power** at 120 volts, 60 hertz, the same as in the U.S. Reliability is good, but rare surges or outages could affect electronic equipment. Fresh water at McMurdo is made from sea water using reverse osmosis. Compared to taking it from a stream or a well, as we usually can do in the States, this is an expensive way to get fresh water.

Telephone calls can be made 24 hours a day from dorm rooms that have phones. Remember to bring a calling card for personal calls. Charges for these calls originate in Washington State. In other words, if you are placing a call to New York City, the charges will reflect a Washington state to NYC call. Business calls are made using an authorizing Personal Identification Number (PIN), assigned by your supervisor or, for grantees, the Crary Lab Supervisor. **Incoming calls** are restricted to USAP business.

Communication radios and pagers may be checked out through the communications department on station for business use.

Fax machine. Fax machines are available for limited use with permission of your supervisor. Grantees can use the Crary lab fax machine whenever needed.

E-mail and Internet access is available 24 hours a day. Due to bandwidth limitations, recreational downloads via web or point-to-point file sharing programs are blocked.

Grantees: Computers and LAN drops for personal laptops are available in the Crary Lab's Telesciences area, which all grantees have access to at all times. (Grantees can also make dialup connections from their dorm rooms using their own laptops). Both Macs and PCs are available in the Telesciences area, as is a scanner, a color printer and an E-size plotter. Grantees can download and send files from any networked machine in McMurdo, but bandwidth limitations (912k shared by 1,000+ people) can result in slow Internet connections and file transfer speeds. All computers in the Crary lab have CD burners, and DVD burners are available on request. Grantees will be allocated blank CDs and DVDs as specified in their Research Support Plan. Digital camera card readers are available in Telesciences.

NOTE: McMurdo's bandwidth is overtaxed, making Internet connectivity extremely slow!

PROHIBITED AT MCMURDO STATION AND SURROUNDING FIELD CAMPS

- No streaming media without prior approval.

Mail. The post office at McMurdo offers all regular services (letter and package mail, money orders, stamps, etc.) and operates routine hours. It does not send COD mail. The post office only accepts U.S. cash and travelers checks. During the winter season it is closed because there is no transportation available. It does open during WINFLY.

Mail for WINFLY (mid-August) delivery should be sent after the first week in July or it will be returned. WINFLY transportation and space for parcel mail is limited. First priority is to wintering participants and then to those going to McMurdo dur-

ing WINFLY. If there is not space available for your package it will be held in Christchurch until space allows during Mainbody (October).

Packages destined for summer participants should be mailed **after Labor Day** or they will be returned.

Your address in McMurdo will be:

McMurdo Summer and Winter - Grantees:

[your name]
McMurdo Station
Project [insert your #]
PSC 469 Box 800
APO AP 96599-1035

McMurdo Summer and Winter - RPSC Employees:

[your name], RPSC
McMurdo Station
PSC 469 Box 700
APO AP 96599-1035

There are 3 **television** channels and several **radio** feeds in McMurdo. Provided by American Forces Radio and Television Service (AFRTS), television offerings include live and taped news, sports and general entertainment programs. The radio stations combine popular music, news and local programming scheduled by volunteer DJs from the community. In addition, movies are programmed locally via cable television. Additional channels offer timely weather, transportation and other general community information. Many common areas are equipped with televisions and VCRs. Participants may wish to bring a small radio. A limited number of television sets are available via a lottery system for dorm rooms. A free video checkout library is operated by the Station Store.

There are **recreational facilities,** including a library, clubs, climbing wall/bouldering cave, gymnasium, weight room, aerobics room, band room and bowling alley. Volunteers frequently organize art shows, chili cook-offs, running races, yoga classes, dances, league play, lessons, lectures, etc. CDs, musical instruments, cross-country skis and other items are available for rental.

Laundry facilities and detergent are provided at no charge for personal use in the dormitories. Participants are responsible for washing linens and clothing.

Chaplain services are provided by a military Protestant chaplain and New Zealand Catholic priests, who rotate on one month intervals. In addition to conducting regular worship services and religious programs, the chaplain accommodates all religious practices and is available for counseling, both religious and secular. The chapel program provides opportunities for volunteers to use their gifts in ministry and service.

Food service at McMurdo Station is cafeteria style. There is no charge for meals. Take as much as you want, but, to minimize cost and the waste McMurdo has to manage, eat all of what you take. After dining, if the room is crowded, please leave to make room for others. Arrange with the food service management for takeout meals for those ill or on duty. In addition to the regular three meals, in summer a midnight meal is served first to night workers and then the general population.

The **McMurdo Clinic** provides health care on a walk-in basis during posted hours, 6 days a week. Walk-in hours are extended during busy summer months to accommodate shift workers. Hours are posted at the entry and on the TV information scroll. For emergencies, staff can be reached 24-hours by calling the fire dispatch emergency number. The facility is equipped to handle a wide range of minor illnesses and injuries, and to stabilize critical patients for evacuation. Services include x-ray, laboratory, pharmacy and nursing. During the summer season, a dentist is available by appointment to cover most dental emergencies. Physical therapy is available by referral only, for rehabilitation of injuries on station. During the winter season, the physician has limited capability to treat and manage dental and rehabilitation needs.

All injuries should be evaluated at the clinic. The physician will determine whether a Worker's

Compensation report should be filed, and provide information to the Safety Manager.

Vehicles at McMurdo are principally for support of science projects. They are assigned to investigators by the Mechanical Equipment Center (MEC). The vehicles are not for personal or recreational use. Report all mechanical problems promptly to the Vehicle Maintenance Facility.

Trash. It is the responsibility of all persons to keep the station presentable by properly sorting and disposing of packing materials and other trash, which is recycled to the extent practical. By entering a U.S. antarctic station, you automatically consent to abide by local procedures prescribed for waste management. See Waste Management in this chapter for some of the rules. Other details will be provided to you.

Albert P. Crary Science and Engineering Center (CSEC). This research center at McMurdo Station was dedicated in November 1991. The laboratory is named in honor of geophysicist and glaciologist Albert P. Crary (1911-1987), the first person to set foot on both the North and South Poles. It is sometimes referred to as the Crary Laboratory.

The laboratory contains state-of-the-art instruments and equipment to facilitate research and to advance science, technology, and education. It contains personal computers and workstations, and a local area network. It primarily supports funded investigators by providing laboratory space, analytical instrumentation, and staging areas for a wide range of scientific disciplines.

The Crary Lab has five pods built in three phases to make 4,320 square meters of working area. Some of the rooms and labs contained in the Crary Laboratory are: telescience room, computer room, conference rooms, lounge, analytical chemistry labs, general use labs, a storage/receiving and staging area, chemistry labs, microbiological labs, radioisotope lab, walk-in freezers, chemical storage, environmental rooms, field-party staging areas, electronics workshop, darkroom, ice and rock sectioning rooms, SAR ground station, an aquarium and holding tanks, and offices.

The laboratory is managed with direction from the NSF and advice from the McMurdo Area Users Committee (MAUC). The RPSC Manager of Laboratory Science ensures that operations comply with safety, environment, and health requirements. A chemical-hygiene plan is provided to users. The NSF urges users and visitors to take pride in the laboratory and to keep it clean and neat.

Amundsen-Scott South Pole Station

This station, at the geographic South Pole, is on the polar plateau at an elevation of 2,835 meters (9,300 ft). It is situated on a 2,700 meter (9,000 ft) thick plateau of ice. It is 850 nautical miles south of McMurdo. The station is drifting with the ice sheet at about 10 meters (33 ft) a year.

South Pole Station is supplied entirely by LC-130 airplanes from McMurdo Station, which operate only from late October through mid February. The station is isolated the rest of the year. The original station was built in 1956-1957. A replacement station was completed in 1975. It consists of an aluminum geodesic dome 17 meters high and 50 meters in diameter plus four large, steel archways connected by smaller steel arched passageways. In the dome, prefabricated vans house living quarters, a galley, a science center, a communications center, a post office, Station Store, and a library. As part of a safety upgrade, a new power generating plant, fuel depot, and maintenance shop were constructed under new and remodeled archways. Currently, a substantial multi-year modernization project is underway to replace the main facilities under the dome with a new above-surface station. In addition, two new buildings will be added to the remote science facilities and station satellite communications capabilities will be increased.The winter population varies from 70 to 80, and the summer population averages 220.

The mean annual **temperature** is –49°C (–56°F). Average monthly temperatures range between –28°C (–18°F) in the summer and –60°C (–76°F) in winter. The record high of –l3.6°C (7.5°F) was recorded in December 1978, and the record low of –82.8°C (–117°F) was recorded 23 June 1982. Precipitation is about 20 centimeters of snow (8 centimeters water equivalent) per year, with very low humidity. Drifting is the primary factor in accumulation of snow around the buildings. Average wind speed is 10.8 knots.

Research includes astronomy and astrophysics, aeronomy auroral and radio-science studies,

meteorology, geomagnetism, earth-tide measurements, seismology and glaciology.

Telephone calls can be made from the South Pole during satellite coverage, currently 12 hours a day. Remember to bring a calling card for personal calls. Charges for these calls originate in Denver, Colorado. In other words, if you are placing a call to New York City, the charges will reflect a Denver to NYC call. Science, business and emergency related calls can be made with an Iridium phone during times of no satellite coverage. Incoming emergency calls must be routed through RPSC or the NSF.

Fax Machine. There currently is no fax machine service available at South Pole. Scanned images of documents are transmitted via e-mail to eFax, a company who in turn faxes the document to the recipient. For incoming service, faxes are sent to eFax, who then e-mails it to the Pole, where it is printed.

E-mail and Internet access is available only during satellite coverage, currently 12 hours a day.

Mail. South Pole has an official U.S. Post Office. However, it does not offer any registered services or sell money orders. Mail is placed aboard resupply airplanes and routed through McMurdo Station.

Packages destined for summer participants should be mailed **after Labor Day** or they will be returned.

Your address at South Pole (both summer and winter) will be:

[your name, Project # or RPSC]
South Pole Station
PSC 468 Box 400
APO AP 96598

Ham radio (amateur radio) connections are also available for calls to the United States. Schedules depend on volunteer operator availability and signal conditions but are usually announced. Calls are placed over the ham radio and patched into the phone system from the operator's location in the U.S. Charges will be for a collect call from the operator's location to the party being called. Remember that these are not private conversations and some business discussions (banking, for example) are not permitted.

An aerial view of the new elevated station being built at Amundsen-Scott South Pole Station.

Meals. Food service at the South Pole is cafeteria style. There is no charge for meals. Take as much as you want, but eat all of what you take. Remember, every piece of food thrown in the garbage has to be flown out of Pole. Arrange with the food service management for takeout meals for those ill or on duty. In addition to the regular three meals, in summer a midnight meal is served first to night workers and then the general population. Volunteers provide assistance on special occasions.

Household duties (chores) are shared by all personnel on a rotating basis.

The Station Store stocks very limited supplies of toiletries and alcoholic beverages. A large variety and quantity of Antarctic and South Pole souvenirs are available for purchase. Only cash and travelers checks are accepted at the store.

ATMs are not available at the South Pole due to the limited satellite availability. RPSC employees are able to have funds taken out of their bi-weekly paychecks and obtain this money while on station. Grantees are able to cash up to $500 in personal checks at the store each month.

Housing. Housing facilities at the South Pole are very limited. Many summer participants are housed in what is referred to as Summer Camp, which consists of Jamesways (canvas Quonset Huts) and Hypertats (highly insulated modular buildings similar to Quonset Huts). Rooms are somewhat private and measure approximately 6x8 feet. Bathrooms and showers are available in three separate buildings (therefore, if you need to use the bathroom, you will need to put on your parka and boots to get there) and each has a male and female side. Rooms also are being used in

the new elevated station. These rooms are generally single rooms with community shower and bathroom facilities for male and female. With three working shifts at South Pole during the summer, there is always someone trying to sleep. Please be aware of the noise level as courtesy and consideration is a must.

Water conservation at South Pole Station is critical. Participants are limited to 2 two-minute showers each week.

Laundry facilities and detergent are provided free of charge, but due to water conservation, participants are only allowed one load of laundry each week.

Recreational facilities include a library, pool table, ping-pong, darts, cards, videos, etc. There is a small gymnasium, weight room, and a sauna.

A **physician,** with emergency dental training, is accessible on station at all times. Unless it is an emergency, please call the clinic in advance to ensure the doctor is available.

Altitude sickness. Amundsen-Scott South Pole Station is at a physiological elevation above 3,000 meters (10,000 feet). The flight from McMurdo doesn't allow time to acclimate en route. You should check with your doctor to see if living at the high altitude will affect any preexisting medical problem. A medicine called Diamox will be available at McMurdo Clinic. Treatment should begin 24 hours before leaving for the high altitude. This medicine is contraindicated for those allergic to sulfa medications. The signs of altitude sickness are shortness of breath that is not relieved promptly by resting, headache, dizziness, and difficulty sleeping. They can be minimized by avoiding strenuous activities the first two days, increasing fluid intake, stopping or limiting smoking, and avoiding alcohol and caffeine. Altitude sickness can occur as late as five days after reaching altitude, and occasionally, can progress to a serious medical condition requiring evacuation to a lower altitude. Anyone developing symptoms should see the local medical provider.

The South Pole Users' Committee (SPUC) provides RPSC with feedback and suggestions on staffing, facilities and the policies that guide South Pole operations. The SPUC may recommend improvements and suggest the relative priority of their recommendations of the South Pole Research site. Members (9) of SPUC represent the wide range of science activities at the South Pole Station, with particular emphasis on those activities with current or previous NSF/OPP support for research at South Pole Station.

Palmer Station

Although the U.S. has had long historical ties to the Antarctic Peninsula, it did little work there until 1965 when a small biology facility, Palmer Station, was established. It is named after Nathaniel B. Palmer, the American sealer who pioneered exploration of the Peninsula area in 1820. In 1970 the new and current station was completed on Anvers Island, at 64°46'S, 64°03'W. The station, built on solid rock, consists of two major buildings and three small ones plus two large fuel tanks and a dock.

Ship access is usually year-round. Foreign, tour ships, and sailing yachts visit frequently during the summer months. Palmer is not regularly served by airplane, and no permanent landing field is maintained there.

Wildlife at Palmer Station is abundant which makes it superbly located for biological studies of birds, seals, and other components of the marine ecosystem. It has a pier and facilities for the research vessels that support logistics and research in the marine sciences. It has a large and extensively equipped laboratory and sea water aquarium. Meteorology, upper atmosphere physics, glaciology, seismology, and geology have also been pursued at and around Palmer Station. The immediate vicinity is a dedicated Long Term Ecological Research (LTER) site. As with elsewhere in Antarctica, all interactions with wildlife are strictly governed by the Antarctic Conservation Act.

Station **population** is approximately 44 in the summer and 20 or more in winter. Unlike South Pole and McMurdo Stations, Palmer usually receives transportation year-round and does not have a distinctive period of winter isolation.

Housing at Palmer Station is similar to college dormitories with community bathrooms down

the hall. Linens, blankets and pillows are provided. Participants are assigned a roommate. Washing machines, dryers and detergent are provided free of charge. There is also a sauna. Everyone at the station participates in household duties such as cleaning the common areas.

Palmer's **climate** is milder than that of the other U.S. antarctic stations primarily because it comes under the influence of a polar-maritime air mass. The mean annual temperature is –3°C (27°F). Average temperatures range between 2°C (36°F) in the summer and –10°C (14°F) in the winter. The annual average wind is about 10 knots. Compared to other U.S. Antarctic Program stations, precipitation is high. Compared to other U.S. Antarctic Program stations precipitation is high, with ample rainfall. The water equivalent in snow and rain averages 81 cm (32 inches) per year.

Palmer Station is the smallest of the three research stations operated by the U.S. Antarctic Program.

Water conservation is encouraged but usage is not restricted.

Vehicles consist mainly of Zodiac boats, snowmobiles and all-terrain vehicles.

Training is required before participants are allowed in Zodiacs on the water. Depending on your position you may be required to complete *Boating I, Boating II, or The Islands Course* which covers the location of survival caches, signaling, radio operations, survival skills, cold water immersion, etc.

Science. The science resources at Palmer Station are managed with direction from the NSF, which includes input from the Palmer Area Users Committee (PAUC). It is the responsibility of the RPSC Manager of Laboratory Science to ensure that operations comply with safety, environment and health requirements. All users are provided with a chemical hygiene plan. The NSF urges users and visitors to keep the laboratory spaces clean and safe.

There is no live **TV** or **radio,** but videos and DVDs are available for viewing in the lounge area.

Telephone calls can be made from Palmer Station 24 hours a day. Remember to bring a calling card for personal calls. Charges for these calls originate in Denver, Colorado. In other words, if you are placing a call to New York City, the charges will reflect a Denver to NYC call. Friends and family can contact you via the station's main number which also originates in Denver: 720-568-2775.

Fax machines are available for limited use with permission of your supervisor.

E-mail and Internet access is available 24 hours a day.

Mail. There is no APO service available to South America or Palmer Station. The station has no post office, but accepts and distributes letters and packages. Mail reaches Palmer Station on each southbound vessel, about once a month. Friends and family should send letters about 2 weeks in advance of the ship's scheduled departure from Punta Arenas. Package mail sent through Port Hueneme should be mailed at least 3 weeks ahead of the scheduled departure.

Flat/Letter Mail (first class mail and magazines) and Small Parcels (less than 2 lbs.) should be sent to the RPSC office address.

Small parcels must include a detailed packing list on the outside of the box before they can be forwarded to the station. The packing list should include a list of contents and estimated value along with contact information for the sender. Parcels will be forwarded to the station on a space-available basis and may be forwarded to Port Hueneme for shipment if they exceed the size limits. Since packages travel through customs in the U.S. and Chile, it is possible that they'll be opened in transit.

your name]
[Palmer Station or Vessel Name]
c/o Raytheon Polar Services Company
7400 S. Tucson Way
Centennial, CO 80112-3938

Package Mail should be sent to Port Hueneme for shipment via the USAP Cargo System. Package mail may be sent to the U.S. Antarctic Program cargo facility in Port Hueneme, California, for delivery to Punta Arenas, Palmer Station, or the research vessels. This method is relatively inexpensive, but **cannot be used for letter mail** (use the Denver office method). Packages sent via Port Hueneme may require two months or longer for delivery to Punta Arenas because packages are sent surface shipment on commercial vessels.

Packages sent via Port Hueneme become international cargo and as such are subject to the applicable laws and regulations which govern these shipments. These regulations are numerous and require that shipments be certified as hazardous or not. Packages cannot be sent without a declaration of contents and value. You must provide a packing list on both the inside and outside of each package. Failure to provide accurate packing lists will result in rejection of the package and its return to sender.

Your packing list must show the following information:

1. Sender's name and address
2. Final destination of the package (your name and location)
3. Itemized list of the contents and their value

There are two addresses for Port Hueneme depending on the shipping method:

Via the US Postal Service:	**Via All Other Carriers (FedEx, UPS, DHL, etc.):**
NSF Contractor Representative P.O. Box 338 Port Hueneme, CA 93041 Forward to: [Your Name] [Palmer Station or Vessel Name]	NSF Contractor Representative Building 471 North End USN-CBC Port Hueneme, CA 93043 Forward to: [Your Name] [Palmer Station or Vessel Name]

NOTE: If you are placing **catalog or Internet** orders to be shipped to the station, use the appropriate address above and send an e-mail to Port Hueneme letting them know that the package is coming. This will avoid confusion and delays in shipment. Your message should include the vendor name, package contents, your name, final destination and tracking numbers (if known). E-mail: lee.degalan@usap.gov

Flat and Package Mail can be shipped directly to Chile via Chilean Postal Service, however this method can be **unreliable and very slow**. Mail can be forwarded to the station or vessels or it can be held for you in Punta Arenas depending on how it is labeled. The address is:

[Your Name]Palmer Station, Antarctica
c/o AGUNSA
Deposito Franco Antarctico
Av. Independencia 772
P.O. Box 60-D
Punta Arenas, Chile

A **physician,** with emergency dental training, is accessible on station at all times. Unless it is an emergency, please call the clinic in advance to ensure the doctor is available.

Meals are prepared by a cook and assistant. Clean-up is done on a rotating schedule by all Palmer Station residents.

Recreation opportunities are available. There is an exercise room with weights and cardio machines. There is also a self-service bar, a TV lounge, billiard and ping pong tables, etc. There are some arts and craft supplies available as well as a limited selection of cross-country skis and snowshoes. The station also has a small darkroom that can be used for recreation. Boating (after training has been completed) is available as weather permits and is a popular way to enjoy the wildlife in the area.

A small **Station Store** stocks a limited supply of toiletries, souvenirs and beverages.

Research Vessels

The ***R/V Nathaniel B. Palmer (NBP)*** began science operations in late 1992 when it sailed from Punta Arenas, Chile, in support of the Russian-United States Ice Camp Weddell. Since then, the 95-meter NBP has sailed more than 90 science cruises and is now into its second long-term charter in support of USAP marine science research.

The NBP's main engines provide a total horsepower of 12,720. This rating, along with hull strength and other criteria, combine to qualify it for classification by the American Bureau of Shipping (ABS) as an ABS A2 icebreaker (able to break 3 feet of ice at a continuous forward speed of 3 knots). A modern multi-disciplinary research vessel, the NBP has eight laboratories totaling 515 square meters. It can accommodate 32 scientists on cruises as long as 75 days.

The NBP has worked in many areas of the Southern Ocean, including the Ross and Weddell Seas, the Bransfield Strait, and has completed two circumnavigations of Antarctica in support of USAP research projects.

The research vessel Nathaniel B. Palmer *is an ice-breaking ship used for scientific research by the U.S. Antarctic Program.*

The ***R/V Laurence M. Gould (LMG***), completed in December 1997 as a replacement for the *R/V Polar Duke*, began its service in Antarctica on 16 January 1998. Since then, the LMG has sailed in support of more than 50 science cruises. This ABS A1, 70.1-meter ship, has an available horsepower of 4,576 in open water operations and 3,900 horsepower during operations in ice. The A1 rating classifies the LMG as being capable of breaking one foot of first-year ice while maintaining continuous forward progress. Like the NBP, this vessel has an endurance of 75 days and a range of 12,000 nautical miles at 12 knots.

The LMG works primarily in the Antarctic Peninsula region, transporting support and scientific personnel and cargo to and from Palmer Station and supporting research throughout the peninsula area. Voyages are also made farther afield, including the Weddell Sea.

Both vessels are equipped with an enclosed Baltic Room, a diverse sonar suite, a specially designed aquarium room, moon pool, and an uncontaminated seawater system delivering water to several labs. The NBP seawater supply is also available on the 03 Level's Helo Deck.

Both the NBP and LMG are owned and operated by Louisiana-based Edison Chouest Offshore (ECO) and were built by North American Ship Building, a subsidiary of ECO located in Larose, Louisiana.

Living conditions on the research vessels include two-person cabins; private toilets and showers are available in each cabin. Each ship has laundry facilities, exercise rooms, and TV lounges with DVDs and videos. Cafeteria-style meals are provided. Be aware that travel on the U.S. Antarctic Program research vessels often involves passing through some of the roughest seas in the world. If you are prone to motion sickness or have never sailed before, consult with your personal physician for the appropriate medication before you leave home.

E-mail is available on both ships and is sent and received at least twice daily. The message size and the use of the attachments in e-mail from the vessels is limited and there is no Internet connection available while at sea. Please consult your point-of-contact for the current vessel e-mail policy.

Telephone service via the Iridium satellite phone system is available for personal use via reasonably priced Iridium calling cards that can be purchased once onboard. INMARSAT is also available 24 hours a day-but at a high cost (approximately $5 a minute). Personal calls via INMARSAT must be placed using a credit card.

Mail to participants on the research vessels can be routed through the husbanding agent (AGUNSA) in Punta Arenas. Please consult the mail information described under Palmer Station to find appropriate mailing addresses. For cruises originating in New Zealand or elsewhere, please

consult your point-of-contact for mailing instructions.

Vessel sailing schedules can be viewed at: www.usap.gov.

FACILITY ADMINISTRATION

The NSF, a federal agency, plans, funds, manages, and coordinates the U.S. Antarctic Program in accordance with U.S. Government policy.

The Department of Defense (U.S. Air Force, Air National Guard, Army, Military Sealift Command, and Air Mobility Command) and the Department of Transportation (Coast Guard) provide logistics, as requested by the NSF, on a reimbursable basis. The NSF contracts with RPSC for operation of the research ships and stations, and for facilities planning and construction, and for logistics services.

Senior U.S. Representative in Antarctica. The Director of the National Science Foundation has designated the Office Director, Office of Polar Programs, as the Senior U.S. Representative in Antarctica, or SUREPA. During the austral summer operating season, the Office Director sometimes designates ranking officials of the U.S. Antarctic Program to serve as Senior U.S. Representative in Antarctica. The official designated is normally located at McMurdo Station during the summer operating season. The Senior U.S. Representative ensures that U.S. policy and directives for the U.S. Antarctic Program are implemented, represents the U.S. as it interacts with foreign nations in Antarctica, ensures that U.S. sponsored antarctic activities are carried out consistent with the Antarctic Treaty, and takes appropriate action in personnel matters not subject to military or other authority. At McMurdo, the SUREPA's office is located in the NSF Chalet.

NSF Representative, Antarctica. The NSF Representative, Antarctica, is on the continent throughout the austral summer and is the Foundation's principal representative for implementing the planned field operations. He/she coordinates and establishes on-site priorities for field support of U.S. Antarctic Program activities, coordinates the supervision and direction of the NSF contractor's efforts at McMurdo and the inland sites, and serves as an NSF spokesperson. The NSF Representative has an office located in the Chalet at McMurdo Station.

NSF Science Representative. The NSF Science Representative, Antarctica, the Foundation's principal representative for antarctic science activities, interacts with investigators and the NSF Representative to set science-support priorities, give on-site direction to the RPSC laboratory services manager on science matters, and serve as the NSF science spokesperson. The position is occupied by different NSF science program managers over the course of the summer. At McMurdo Station the NSF Science Representative has an office in the Albert P. Crary Science and Engineering Center.

NSF McMurdo Station Manager. The NSF McMurdo Station Manager is a year-round position at McMurdo whose function is to oversee operation of station facilities. The manager interacts with all organizations represented at McMurdo. In winter, the NSF manager is the ranking U.S. Government official at McMurdo.

Commander, Support Forces Antarctica (CSFA) is the commander of Department of Defense support forces in the U.S. Antarctic Program and is the commander of Air National Guard Detachment 13 in Christchurch, New Zealand.

NSF Representative, Antarctic Peninsula. The NSF Representative, Antarctic Peninsula, is resident at Palmer Station or aboard research vessels during a part of the austral summer. This person coordinates U.S. activities in the Peninsula area.

NSF Representative, South Pole is resident at South Pole Station during a part of the austral summer. This person coordinates U.S. activities at South Pole Station.

RPSC Area Director. RPSC has an Area Director at McMurdo Station and South Pole Station during the austral summer. This person, in conjunction with the Senior RPSC Representative, oversees all contractor support activities. The RPSC Winter Site Manager serves in this role during the winter months.

Station Science Leader. The National Science Foundation designates a science leader for U.S. Antarctic Program stations. The Station Science Leader is directly responsible to the Office of Polar Programs when no NSF Representative is on the continent. Researchers at each station, or working out of the station, are responsible to the Station Science Leader, who coordinates science projects and arranges for the logistics needed to support them. Researchers request support from the Station Science Leader during the winter, who consults with the NSF McMurdo Station Manager (at McMurdo) or the Station Manager (at South Pole or Palmer Stations) to arrange the support. The Station Science Leader clears official messages concerning research projects before dispatch.

RPSC Winter Site Manager. This position is responsible for all station support activities including local support for science projects. At McMurdo Station, the NSF Station Manager is designated as the senior official on station. At South Pole and Palmer, the Winter Site Manager and support personnel maintain the station and support the research projects. In an emergency, the Winter Site Manager is in complete charge of everyone at the station.

Marine Project Coordinators are provided by RPSC on both the *R/V Nathaniel B. Palmer* and the *R/V Laurence M. Gould.* RPSC provides Marine Projects Coordinators (MPC) on both vessels, who coordinate and direct shipboard activities in conjunction with the Ship's Master. The MPC and the Ship's Master make all decisions regarding the safe conduct of the ship.

User Committees. RPSC convenes an annual McMurdo Area User Committee (MAUC), a South Pole User Committee (SPUC), an Antarctic Research Vessel Oversight Committee (ARVOC) and a Palmer Area User Committee (PAUC) to review the effectiveness of the various Antarctic laboratories. These committees review input collected from grantees, NSF representatives, RPSC Laboratory Managers, etc., to assess safety, environment and health requirements, space allocation, scheduling, equipment status, staffing, communications, computing and to plan operational requirements for the coming season. ■